



Using Science to “Cheat” Cheatgrass

If you ask the Roads End Prescribed Fire Burn Boss how the fire burned, she would say it was “light and spotty.” Under some circumstances, this would be a disappointing outcome, but in this case, it was exactly what the fire managers at Sequoia and Kings Canyon National Parks wanted.

The Roads End Prescribed Fire in May 2005 was designed to restore the pattern of fire on the landscape while minimizing the impacts of an invasive plant species: cheatgrass. This highly flammable plant from Europe and Asia has invaded forests across the western United States changing the way fires burn and choking out native plant species.

No one knows for sure how cheatgrass was originally introduced into the area, but one likely method was inside hay for stock animals. Cheatgrass increased dramatically in the parks after prescribed burns were conducted in the 1980s and 1990s. In 1998, the parks suspended the prescribed fire program in Cedar Grove to conduct a research project. Fire managers and researchers wanted to know the combined role that fire may be playing in spreading or limiting cheatgrass. Funding was acquired through the Joint Fire Sciences Program and researchers from the United States Geological Survey (USGS) designed the methods. In 2001 and 2002, scientists and fire crews conducted experiments at a variety of sites to analyze the success or failure of cheatgrass given different levels of nutrients, fuel, seed, shade, or fire.

Although many of the treatments had only mild effects on cheatgrass, one seemed to offer some hope. Scientists found that in unburned plots, a two-inch layer of pine needles was very effective at eliminating cheatgrass. Adapting this information for burn management, the parks could choose to build-up pine needles by allowing more time between fires and then conducting periodic low-intensity fires to protect the trees that produce needles and reduce soil disturbance.

Can it be this simple? Unfortunately, no. If the parks allow too much material to buildup on the ground in order to control cheatgrass, fire intensities would change. The historic low-intensity fires characteristic of ponderosa pine forests would be replaced by high-intensity fires. Cheatgrass researchers found that when plots with heavy litter burned intensely, few cheatgrass seeds survived, but those that did formed vigorous plants.

So, what is the balance? For now, fire managers will apply what was learned and burn less frequently and under cooler conditions to control intensity. The Roads End Prescribed Fire was the first burn that was planned using information from the research project. It was conducted in late-spring to achieve lighter burning conditions and the whole unit was surveyed for cheatgrass prior to burning. This baseline information will help managers understand if the effort was successful when the area is resurveyed in the future.

Have the parks been able to “cheat” cheatgrass? Time will tell. Cheatgrass will never be completely eliminated from the area, but fire personnel and researchers will keep looking for ways to minimize its impacts on native plants.

For more information about this cheatgrass study, contact Tom McGinnis (tmcginnis@usgs.gov) or Jon Keeley (jon_keeley@usgs.gov).

